

**DEPARTMENT OF TRANSPORTATION****DIVISION OF ENGINEERING SERVICES**

Office of Structural Materials

Quality Assurance and Source Inspection



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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 1.28**WELDING INSPECTION REPORT****Resident Engineer:** Pursell, Gary**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-012749**Date Inspected:** 22-Mar-2010**Project Name:** SAS Superstructure**OSM Arrival Time:** 1300**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 2130**Contractor:** American Bridge/Fluor Enterprises, a JV**Location:** Job Site**CWI Name:** See Contents in Report**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** Orthotropic Box Girders**Summary of Items Observed:**

At the start of the shift the Quality Assurance Inspector (QAI) traveled to the project site and observed the following work performed by American Bridge/Fluor Enterprises (AB/F) personnel at the E1/E2, E2/E3 and W1/W2 field splices:

- A). Welding of the Field Splice E2 to E3.
- B). QC MPT/UT of the Field Splice E2 to E3
- C). Assembly Fit-up of Field Splice W1/W2
- D). MPT of Backgouge on Field Splice E1/E2

A) Field Splice E2/E3, WN: 2E-3E-B

The QAI observed the Complete Joint Penetration (CJP) groove welding of the edge plate field splice identified as Weld Number (WN): 2E-3E-F, Segment F1. The welding was performed by the AB/F personnel Songtao Huang ID-3794, utilizing the Flux Cored Arc Welding (FCAW-G) process, with the welding progression in the vertical up position (3G), as per the Welding Procedure Specification (WPS) ABF-WPS-D15-3040B-3 Rev. 0 and the AWS D1.5-2002 Chapter 5/Section 5.12. The WPS was also used by the AB/F Quality Control (QC) Inspector James Cunningham as a reference to perform QC verification of the Direct Current Electrode Positive (DCEP) welding parameters during the CJP groove welding of the edge plate field splice. Later in the shift the QAI observed the QC inspector verifying the welding parameters of each welder and were noted as follows: 226 amps, 22.9 volts and a travel speed measured at 139 mm/minute. The QC inspector also monitored the surface temperatures during the field welding and the following was observed and noted by the QAI: the minimum

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preheat temperature of 60 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius.

The QAI also observed welding personnel Mitch Sittinger ID-0315 and Jordan Hazelaar ID-2135 performing the excavations and repair welding of the rejects as indicated on the field splice identified as WN: 2E-3E-A, Segment A2. The repair welding performed by the welders utilized the Shielded Metal Arc Welding (SMAW) process as per the WPS identified as ABF-WPS-D15-1000 Repair Rev. 2. which was also used by the QC inspector, Steve McConnell, as a reference to verify the DCEP welding parameters which were observed and noted accordingly by the QAI as follows: 135 amps and 129 amps. The surface temperatures were verified by the QAI inspector and were noted as follows: the minimum preheat temperature of 60 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius.

### B) Field Splice E2/E3, WN: 2E-3E-A

The QAI also observed the Ultrasonic Testing (UT) of the transverse CJP weld on deck plate field splice identified as WN: 2E-3E-A, Weld Segment A2. The testing was performed by the QC technicians Steve McConnell and Tom Pasqualone utilizing a USM 35 and a US-52L, manufactured by Krautkramer. The QAI observed the UT technicians perform the required longitudinal and shear wave scanning technique during the testing which was performed utilizing a 1" diameter used to perform base metal soundness and a .75 x .75 rectangular transducers used to perform the angle beam technique for weld soundness. The technicians performed the testing utilizing the longitudinal and transverse scanning techniques as per the UT Procedure identified as SE-UT-D1.5-CT-100 Rev.4. There appears to be an approximate total of 16 rejects thus far.

### C) Field Splice W1/W2, WN: 1W-2W-D

The QAI also observed the fillet welding of the fitting gear to the bottom plate field splice identified as WN: 1W-2W-D, Segments D1 and D2. The welding was performed by Rick Clayborn ID-2773 utilizing the SMAW process as per the WPS ABF-WPS-D15-F1200A Rev. 1. The welding parameters were verified by the QC inspector Mike Johnson and were noted as follows: 126 amps. At the conclusion of the welding Mr. Clayborn commence the installation of the backing bar.

### D) Field Splice E1/E2, WN: 1E-2E-D

The QAI inspector observed QC inspector's Jesse Cayabyab and Bonifacio Daquinag perform the Magnetic Particle Testing (MPT) on the backgouged surface of the CJP groove weld "B" Face surface of the bottom plate field splice identified as WN: 1E-2E-D. The backgouged surface appeared to be finished to a bright metal as per the contract document, AWS D1.5-02, Chapter 3/Para. 3.2.6. The MPT performed by the QC technicians appeared to comply with the contract specifications.

### QA Observation and Verification Summary

The QA inspector observed the QC activities and the welding of the E2/E3 field splices utilizing the WPS's as noted above, which appeared to be posted at the weld station. The welding parameters and surface temperatures were verified by the QC inspector's and utilizing a Fluke 337 clamp meter for the electrical welding parameters and a Fluke 63 IR Thermometer for verifying the preheat and interpass temperatures. The 1.4 mm diameter

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consumables identified as ESAB Dual Shield 70 Ultra Plus was utilized during the FCAW-G welding of the CJP groove welds and appeared to be in compliance with the AWS Specification A5.20 and the AWS Classification E71T-1M. The 3.2 mm diameter consumable identified as ESAB Atom Arc was also utilized during the SMAW repair welding and appeared to comply with the AWS Specification A5.1-04 and the AWS Classification E7018 H4R. The QC inspection, testing and welding performed on this shift was not completed, except as noted above, appeared to be in general compliance with the contract documents. The QAI randomly verified the QC inspection, testing and the welding parameters and surface temperatures utilizing various inspection equipment and gages, a Fluke 337 Clamp Meter and Tempilstik Temperature indicators.

The QAI also performed a random ultrasonic verification test of the Complete Joint Penetration (CJP) groove weld identified as WN: 1E-2E-A, Weld Segment A3. A total area of approximately 10% was ultrasonically tested to verify the weld and testing by QC meet the requirements of the contract documents. The QAI performed UT verification between the linear dimensions 15,000 mm and 16,500mm as noted on the steel deck. The examination was performed in the first and second leg and a ultrasonic test report, TL6027, was generated on this date. Also the QAI inspector randomly verified the rejectable areas as indicated by the QC technicians and the QAI concurs with the QC technicians assessment.

The digital photographs below illustrates the work observed during this scheduled shift.



### Summary of Conversations:

There were no pertinent conversations discussed in regards to the project except as noted above.

### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Mohammad Fatemi (916) 813-3677, who represents the Office of Structural Materials for your project.

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**Inspected By:** Reyes, Danny

Quality Assurance Inspector

**Reviewed By:** Levell, Bill

QA Reviewer

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